MOVEMENT OF CENTERS.

The following table shows the date and location of the center for the beginning and ending of each area of high or low pressure that has appeared on the U. S. weather maps during the month, together with the average daily and hourly velocities. The monthly averages are computed in two ways; first, by considering each path as a unit, and second, by giving equal weight to each day of observation:

Movement of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	3, a.m.	47	118	8, p.m.	47	66	3,180	5.5	578	24.1
II	6, p.m.	47	121	10, p.m.	49	91	2,560	4.0	640	26.7
III	17, p.m.	42	113	25, a.m.	23	82	4,390	7.5	585	24.4
IV	23, a.m.	44	125	30, p.m.	47	87	4,428	7.5	590	24.6
Sums							14,558	24.5	2,393	
Mean of 4 paths									598	24.9
Mean of 24.5 days									594	24.8
Low areas.										
I	1, a.m.	33	109	6, p.m.	47	65	2,730	5.5	496	20.7
II	4, p.m.	52	114	7, p.m.	49	91	1,218	3.0	406	16.9
III	7, p.m.	39	105	9, p.m.	38	92	1,194	2.0	597	24.9
IV	20, p.m.	52	113	27, p.m.	47	76	2,538	7.0	363	15.1
Sums							7,880	17.5	1,862	
Mean of 4 paths									465	19.4
Mean of 17.5 days									450	18.7

NORTH ATLANTIC METEOROLOGY.

Fog.—The limits of fog belts west of the fortieth meridian, as reported by shipmasters, are shown on Chart I by dotted shading.

East of the fifty-fifth meridian fog was reported on 22 dates; between the fifty-fifth and sixty-fifth meridians on 20 dates, and west of the sixty-fifth meridian on 22 dates. Compared with the corresponding month of the last seven years, the dates of occurrence of fog east of the fifty-fifth meridian numbered 11 more than the average; between the fifty-fifth and sixty-fifth meridians, 7 more than the average; and west of the sixty-fifth meridian, 7 more than the average. Fog was noted on every day of the month, except the 3d, 17th, and 18th.

OCEAN ICE FOR JUNE.

The following table shows the southern and eastern limits of the regions within which icebergs or field ice were reported for June during the last thirteen years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
June, 1883	40 28	51 45	June, 1883	48 14	42 43
June, 1884	41 42	47 49	June, 1884	44 00	45 23
June, 1885	39 38	48 12	June, 1885	45 14	41 12
June, 1886	40 30	53 00	June, 1886	49 15	40 00
June, 1887	40 40	48 34	June, 1887	43 22	39 19
June, 1888	43 38	43 24	June, 1888	43 38	43 24
June, 1889	42 54	49 54	June, 1889	46 57	40 29
June, 1890	40 01	52 00	June, 1890*	46 08	37 07
June, 1891	40 15	50 24	June, 1891	44 15	43 47
June, 1892	41 44	50 40	June, 1892	45 50	40 46
June, 1893	42 08	53 19	June, 1893	47 20	44 19
June, 1894	40 10	57 30	June, 1894	49 20	36 30
June, 1895	41 08	51 10	June, 1895	50 30	42 51
Mean	41 09	50 35	Mean	46 28	41 21

*On the 10th a small block of ice was reported in N. 46° 28′, W. 38° 34′.

The limits of the region within which icebergs or field ice were reported for June, 1895, are shown on Chart I by crosses. The southernmost ice reported, a berg 200 feet long by 50 feet high, observed on the 10th in the position given, was about the normal southern limit, and the easternmost ice reported, a berg observed on the 18th, in the position given, was about one-half of a degree west of the normal eastern limit of ice for June.

TEMPERATURE OF THE AIR.

The mean temperature only is given for each station in Table II, for voluntary observers, but in Table I, both the mean temperatures and the departures from the normal are given for the current month for all the regular stations of the Weather Bureau.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The distribution of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for all stations having self-registers.

As compared with the normal for June, the mean temperatures for the current month were in excess over the whole of the United States east of the Mississippi River, except in the east Gulf States. The greatest excesses were: Rockliffe, 6.4; Port Stanley, 6.2; Toronto, 5.9; Rochester, 5.6. They were deficient over the Rocky Mountain slope and plateau region, the greatest deficits were: Miles City, 6.4; Qu'Appelle, 5.9; Lander, 5.5; Bismarck, 5.2; Williston, 5.1.

Considered by districts, the mean temperatures for the current month show departures from normal temperatures as given in Table I. The greatest positive departure was: Lower Lake, 4.1. The greatest negative departure was: Northern slope, 4.4.

The *years of highest and lowest mean temperature* for June are shown in Table I of the REVIEW for June, 1894. The mean temperature for the current month was the highest on record at: Northfield, 66.2; Albany, 72.6; Rochester, 70.7; Buffalo, 68.8; Harrisburg, 73.4; Pittsburg, 74.7; Columbus, Ohio, 74.9; Sacramento, 72.9. It was the lowest on record at: St. Vincent, 58.2; Moorhead, 61.4; Miles City, 60.6; Helena, 56.6; Idaho Falls, 56.8; Lander, 56.3; Cheyenne, 56.8; Denver, 61.8; Pueblo, 66.2; El Paso, 77.5.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: Yuma and Fresno, 109 (23d); Red Bluff, 108 (23d); Tucson, 106 (26th). The lowest maxima were: Tatoosh Island, 71 (27th); Neah Bay, 74 (27th). The highest minima were: Port Eads, 75 (1st); Galveston, 72 (21st); Corpus Christi, 70 (6th); the lowest minima were: Baker City, 28 (15th); Idaho Falls, 28 (18th); Lander, 29 (18th); Carson City, 30 (18th).

The *years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Nantucket, 89; Woods Hole, 85; Buffalo, 93; Port Huron, 95; Detroit, 96; Grand Haven, 90; Columbus, Ohio, 99; Pittsburg, 98; Harrisburg, 97; Parkersburg, 99; Indianapolis, 100; Louisville, 100; Knoxville, 96; Cape Henry, 99; Hatteras, 91; Wilmington, 100; Columbia, S. C., 102; Titusville, 95; Concordia, 101; Wichita, 101; Port Angeles, 82. The minimum

temperatures were the lowest on record at: Key West, 69; Lander, 29; Pysht, 37; Fort Canby, 44; Olympia, 35.

The *greatest daily range of temperature and the extreme monthly range* are given for each of the regular Weather Bureau stations in Table I, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values among the greatest daily ranges were: Carson City and Baker City, 46; Idaho Falls and Tucson, 45; Havre and Port Crescent, 44. The smallest values were: Port Eads, 8; Galveston, 13; Hatteras, 14; Key West, 17. Among the extreme monthly ranges the largest values were: Tucson, 68; Fresno, 62; Idaho Falls, 60. The smallest values were: Port Eads, 11; Galveston, 18; Corpus Christi, 20; Key West, 21.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
Upper Lakes	+ 1.5	+ 0.2	New England	− 1.7	− 0.3
North Dakota	+ 7.8	+ 1.3	Middle Atlantic	− 9.7	− 1.6
Missouri Valley	+ 2.6	+ 0.4	South Atlantic	−16.7	− 2.8
Northern plateau	+ 8.5	+ 1.4	Florida Peninsula	−11.7	− 2.0
North Pacific	+ 0.4	+ 0.1	East Gulf	−18.4	− 3.1
			West Gulf	−16.4	− 2.7
			Ohio Valley and Tenn.	−13.5	− 2.2
			Lower Lakes	− 4.8	− 0.8
			Upper Mississippi	− 2.2	− 0.4
			Northern slope	− 5.9	− 1.0
			Middle slope	− 4.3	− 0.7
			Southern slope (Abilene)	−15.5	− 2.6
			Southern plateau	− 5.0	− 0.8
			Middle plateau	− 6.6	− 1.1
			Middle Pacific	− 1.3	− 0.2
			South Pacific	− 1.9	− 0.3

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the *temperature of the wet-bulb thermometer*. An evaporometer may be made to record the quantity of water evaporated from a similar surface during any interval of time. This, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this evaporation the *average humidity of the air* during any given interval of time may be deduced.

The *sensible temperature* experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but equally upon the dryness and the wind, and is apparently the same as the temperature of the wet-bulb thermometer as obtained by the whirling apparatus used in the shaded shelter. The temperature of the wet-bulb thermometer and its depression below the dry bulb are the fundamental data for all investigations into the relation between human physiology and the atmosphere. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The precipitation was heaviest, 3 to 13 inches, in the central and southern portion of the country, but least, averaging less than 0.5, on the Rocky Mountain slope and Pacific coast.

The *diurnal variation* is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 6 are weighing gauges.

The *normal precipitation* for each month is approximately shown in the Atlas of Weather Bureau Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess in the Gulf States, the northern and middle slopes, and especially the southern Atlantic slope; it was deficient throughout the Pacific States, the northern plateau region, upper Mississippi Valley, Lake region, Ohio Valley, and Atlantic States. The large departures from the monthly normal were: Excesses: Abilene, 5.7; Little Rock, 4.7; New Orleans, 3.0. Deficits: Dubuque, 4.0; Indianapolis, 3.6; Grand Haven and Sydney, 3.4; Davenport, 3.2; Galveston, Wilmington, and Detroit, 3.1.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normal exceeds 100).

Above the normal: East Gulf, 115; west Gulf, 129; North Dakota, 122; Missouri Valley, 102; northern slope, 135; middle slope, 123; Abilene (southern slope), 311.

Normal: Southern Pacific, 0.

Below the normal: New England, 68; middle Atlantic, 72; south Atlantic, 75; Florida Peninsula, 80; Ohio Valley and Tennessee, 75; lower Lake, 38; upper Lake, 60; upper Mississippi, 69; southern plateau, 60; middle plateau, 55; northern plateau, 32; north Pacific, 41; middle Pacific, 3.

The *total accumulated monthly departures* from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
Excesses.	*Inches.*	*Per ct.*	*Deficits.*	*Inches.*	*Per ct.*
South Atlantic	+ 0.90	103	New England	− 4.10	81
North Dakota	+ 1.00	110	Middle Atlantic	− 1.50	93
Northern slope	+ 0.90	111	Florida Peninsula	− 0.70	96
Abilene (Southern slope)	+ 1.20	108	East Gulf	− 0.20	99
Southern plateau	+ 0.20	105	West Gulf	− 2.80	88
			Ohio Valley and Tenn.	− 7.30	71
			Lower Lakes	− 6.10	65
			Upper Lakes	− 4.10	74
			Upper Mississippi	− 6.60	63
			Missouri Valley	− 3.90	77
			Middle slope	− 2.20	81
			Middle plateau	− 0.60	92
			Northern plateau	− 3.10	70
			North Pacific	− 0.30	99
			Middle Pacific	− 2.20	88
			South Pacific	− 2.20	80

The *years of greatest and least precipitation* for June are given in the REVIEW for June, 1894. The precipitation for the current month was the greatest on record at: Abilene, 8.40; Pueblo, 2.09; Rapid City, 6.22. It was the least on record at: